

Sur
E3amt
B2

at least 50 weight percent of said second polymer is comprised of said C₄-C₈ conjugated diene units.

B-3
Round
Decision

13. (Twice Amended) A [reaction product] composition according to claim 1, wherein said second polymer is an [elastomeric polymer] elastomer.

14. (Twice Amended) A [reaction product] composition according to claim 1, wherein said terminal nitrogen containing group is derived from N-butylidenebenzylamine.

Please add new claim 22.

B4

22. A composition comprising the reaction product of:

- a) a first polymer comprising a poly(olefin), the polymer including at least one pendent or terminal functional group comprised of a carboxylic acid or an anhydride of carboxylic acid or combinations thereof, and
- b) a non-vulcanized second polymer comprised of a C₄-C₈ conjugated diene monomer and optionally at least one C₈-C₂₀ vinyl aromatic monomer, and further including at least one nitrogen containing terminal group.

REMARKS

The Office Action of December 30, 1999, has been fully considered by Applicants. As a result, the present application has been slightly amended to more clearly define the present invention. In view of the following comments, and the above amendments, reconsideration of the application is respectfully requested. Support for newly added claim 22 is found in original claim 1 and the Examples wherein a non-vulcanized second polymer is employed

I. Rejection of Claims 1-4, 6-10, 13-14, and 21 Under 35 U.S.C. § 112, First Paragraph

Claims 1-4, 6-10, 13-14, and 21 were rejected under 35 U.S.C. § 112, first paragraph on the following grounds.

a) The Examiner contends that the specification does not provide enablement for the language of the claims. Specifically, the Examiner contends that the specification does not provide enablement for a reaction product comprising the first and second polymers. The Examiner states:

Based on the specification, it appears that Applicants invention is compositions comprised of the reaction product from the first and second polymers. However, this is not the language of the claims which need to be suitably modified.

Claim 1 has been amended to read:

A composition comprising the reaction product of...

To conform to this amendment, 1-4, 6-10, 13-14, and 21 have been revised to claim a "composition," as opposed to a "reaction product."

Accordingly, the concern of the Examiner has been remedied.

b) Claims 1-4, 6-10, 13-14, and 21 were rejected on the grounds that the specification is enabling for first polymers which are polyolefins, but does not reasonably provide enablement for other first polymers.

Claim 1 has been amended to recite a polymer comprising a polyolefin.

However, Applicants submit that the specification sufficiently enables the reaction product composition in claim 21 without any amendment thereto. Moreover, the specification (see page 11, step 3) clearly enables a maleated polypropylene as required by claim 21.

Applicants submit that the Examiner's concern regarding independent claim 1, and claims 2-4, 6-10, and 13-14, which are dependent therefrom have been remedied, and independent claim 21 should not have been included in the rejection.

II. Rejection Under 35 U.S.C. § 112, Second Paragraph

Claims 2, 3, 7, 9, and 13 were rejected under 35 U.S.C. § 112, second paragraph as being indefinite. Concerns regarding each of the above-referenced claims, were expressed by the Examiner. These concerns of the Examiner regarding the above claims will be addressed separately.

a) The Examiner contends claim 2 is indefinite because said "carboxylic acid" or "carboxylic anhydride" is defined as a group.

An amendment was filed by Applicants on October 7, 1999. In the October 7, 1999 amendment, the claims, specifically claim 2, were amended such that "group" was removed from the claim language. Applicants submit that such amendment preemptively remedies the Examiner's concerns regarding the use of "group" in claim 2.

b) The Examiner contends claim 3 is indefinite by including the use of "C₂-C₆ α-olefins." Specifically, the Examiner states:

Claim 3 is indefinite because there is no such thing as a "C₂" α-olefin.

Applicants note that claim 4, and not claim 3, included the phrase "C₂-C₆ α-olefin".

In order to remedy the concerns of the Examiner, pending claim 4 has been amended to read:

a polyolefin comprised of at least 80 weight percent α-olefin.

Applicants submit that removing the reference to the number of carbon atoms in the claim language remedies the concern of the Examiner.

c) The Examiner considers claims 7 and 9 as indefinite in regards to what a polymer comprising butadiene signifies. Specifically, the Examiner states:

If Applicant means that the polymer comprises butadiene units, then that is the language which should be used (as in claim 8).

Claims 7 and 9 have been amended such that the claim recites the second polymer comprises polybutadiene units. Applicants submit that the claims as amended remedy the concerns of the Examiner.

d) The Examiner considers claim 13 as indefinite and unclear with respect to what is meant by an "elastomeric material."

Applicants submit that pages 4 and 5 of the specification of the present application sufficiently describe "elastomeric polymers," to provide a clear understanding to the skilled artisan. Nonetheless, Applicants also amended claim 13 to the perhaps, more common term "elastomer". Supporting Applicants contention that the term "elastomer" is widely accepted is an enclosed excerpt from CONCISE "Encyclopedia of Polymer Science and Engineering", John Wiley & Sons 1998, describing "elastomers". Additionally, a search for patents which include the phrase "elastomeric polymer"

produced 800 hits. In addition, a search of the USPTO patent database for patents from 1976 through 2000, which include the word "elastomer" in the claims produced 23,379 hits. In view of these facts, Applicants contend that "elastomer" is a term known in the art and that use of such a term in the present application is not indefinite.

III. Rejection Under 35 U.S.C. § 102(b)

Claims 1-4, 6-10, 13-14, and 21 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,409,365 to Coran et al. Applicants respectfully traverse. As recognized by the Examiner, Coran is significantly divergent conceptionally from the present invention, i.e., "Coran is not directed to the elected species".

Moreover, Coran is directed to an elastoplastic composition comprising a blend of polyolefin resin and vulcanized nitrile rubber. In fact, Coran is more broadly directed to a mixture of the above elastoplastic with a second blend of polyolefin and vulcanized monolefin rubber. Applicants' claims as amended, effectively exclude vulcanized nitrile rubber. Importantly, there is no suggestion provided in Coran to substitute a butadiene (for example) for the required vulcanized nitrile rubber. Accordingly, no case of prima facie obviousness exists.

IV. Rejection Under 25 U.S. C. § 103 (a)

Claims 1-4, 6-10, 13-14, and 21 were rejected as being unpatentable over U.S. Patent No. 5,962,573 to Berta, in view of U.S. Patent No. 5,066,729 to Sayer, Jr. et al. The Examiner also asserts that the above-referenced claims are unpatentable over Berta in view of "Admissions by Applicant."

Applicants traverse these objections for the following reasons.

The '573 patent to Berta teaches a four-part composition consisting of (1) a thermoplastic olefin, (2) an anhydride-grafted thermoplastic polyolefin, (3) an oxidized polyethylene wax, and (4) a functionalized polymer that is reactive with the anhydride groups of the anhydride-grafted polymer. Given the complexity of this system, Berta does not provide any clear suggestion of a maleated polypropylene-amine terminated polybutadiene product.

In fact, Applicants contend that the '573 patent does not clearly demonstrate that the functionalized polymer reacts with the anhydride-grafted polymer. Rather, Applicants note that comparative examples 13 and 14 and examples 16 and 17 demonstrate that

adducts of a functionalized polymer, such as for example amine-terminated polyethylene oxide (ATPEO), are actually detrimental to the composition. Therefore, the '573 patent teaches that the oxidized polyethylene wax is critical to the performance of the composition described therein. The examples, particularly comparative examples 12 and 15, demonstrate the importance to utilizing the oxidized polyethylene wax in the compositions described by the '573 patent. Oxidized polyethylene wax contains oxygen functional groups that are capable of reacting, or interacting by polar forces, with anhydride-grafted polyolefin. The quantity of oxidized wax is greater than the quantity of functionalized polymer in the preferred embodiment. From these facts, one would reasonably conclude (i) that the oxidized wax, not the functionalized polymer, interacts with the anhydride-grafted polymer, and that this interaction is responsible for the improved properties of the composition and, (ii) interaction, if any, between the anhydride-grafted polyolefin and functionalized polymer is detrimental to the properties of the composition.

Additionally, no examples are presented wherein a separately prepared graft copolymer of hydroxy terminated polybutadiene and maleic anhydride-grafted propylene is used to prepare a composition taught by the '573 patent. Accordingly, the Examiner's starting point for deriving unobviousness, i.e., "Berta discloses graft copolymers of polypropylene with polybutadiene grafts....exemplified by a hydroxy-terminated polybutadiene" is not by any means a clear teaching in Berta. Rather, it is derived from the Berta disclosures based on the hindsight of the present invention.

Applicants respectfully submit that the teachings of the '573 patent to Berta would not suggest a reasonable expectation of successfully improving the properties of a composition of an amine-terminated, i.e., functionalized, non-vulcanized polymer (or butadiene) grafted with a maleated polypropylene.

Consequently, Applicants contend that in view of the teachings of the '573 patent to Berta, it would not have been obvious, other than through prohibited hindsight, to use the amine-terminated polybutadienes, as taught in U.S. Patent 5,066,729 to Stayer, Jr. et al., to obtain a grafted polypropylene as described by the present application.

Finally, the instant application demonstrates, in the examples, by means of an extraction experiment, an interaction between the functionalized polybutadiene and the maleic anhydride-grafted polypropylene. Moreover, the instant application demonstrates


improvements in the tensile properties of the composition, rebutting any maintained prima facie obviousness rejection.

Applicants respectfully submit that the present invention, as set forth in claims 1-4, 6-10, 13-14, and 21, is patentable over the above-cited references.

Applicants respectfully submit that the amended claims are novel and unobvious over the prior art and request allowance of the same.

Respectfully submitted,


FAY, SHARPE, FAGAN,
MINNICH & McKEE, LLP.



Scott A. McCollister
Reg. No. 33,961
1100 Superior Avenue, Seventh Floor
Cleveland, Ohio 44114-2518
(216) 861-5582

CERTIFICATE OF MAILING

I hereby certify that this paper or fee is being deposited with the United States Postal Service as first class mail in an envelope addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231 on MARCH 29, 2000.



Georgeen B. George

C:\DATA\2000\MRC\FIR\20007.AM\X